

WHAT IS CLAIMED IS:

1. An optical temperature sensor, said sensor comprising:
an emitter having a selective energy emission band, said emitter emitting energy within
5 said emission band in response to a temperature of said emitter;
a light pipe having a first end and a second end, said first end communicating with said
emitter;
an optical bandpass filter communicating with said second end, said filter having a pass
band corresponding to said emission band; and
10 a detector communicating with said filter, said detector detecting said emitted energy as a
measure of said temperature.

2. An optical temperature sensor according to claim 1, wherein said emitter
contains a rare earth element.

3. An optical temperature sensor according to claim 1, wherein said emitter is
composed of a rare earth oxide.

4. An optical temperature sensor according to claim 1, wherein said emitter is
20 composed of a rare earth aluminum garnet.

5. An optical temperature sensor according to claim 1, wherein said emitter is a
high temperature host material which is doped with a rare earth element.

6. An optical temperature sensor according to claim 3, wherein said rare earth

oxide is ytterbium oxide.

7. An optical temperature sensor according to claim 5, wherein said host material is yttrium aluminum garnet which is doped with a rare earth element.

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8. An optical temperature sensor according to claim 7, wherein said dopant is ytterbium.

9. An optical temperature sensor according to claim 5, wherein said emitter is
10 composed of yttrium oxide doped with ytterbium.

10. An optical temperature sensor according to claim 1, wherein said light pipe is composed of sapphire.

11. An optical temperature sensor according to claim 1, wherein said light pipe
15 is composed of yttrium oxide.

12. An optical temperature sensor according to claim 1, wherein said light pipe is composed of quartz.

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13. An optical temperature sensor according to claim 1, wherein said detector is a silicon detector.

14. An optical temperature sensor according to claim 1, wherein said detector is
25 a lead sulfide detector.

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17. An optical temperature sensor according to claim 1, wherein said sensor operates at temperatures between 625°K and 2683°K.